



Worksheet 4 Stacks Answers

Task 1 Crushing cars

1. (a) Complete the following to show the operations implemented on a collection of burnt-out cars. The stack can hold a maximum of 6 items.

Cars: Mondeo, Golf, Fiesta, Punto, Civic, Porsche

Representations of the stack drawn both horizontally and vertically are shown. Show the state of the stack after each operation in both representations, and in the first table, show any results returned.

	Stack	Result returned
carStack = Stack()	[]	
carStack.push (Mondeo)	[Mondeo]	
carStack.push (Golf)	[Mondeo, Golf]	
carStack.isEmpty()		False
carStack.push(Fiesta)	[Mondeo, Golf, Fiesta]	
carStack.push(Punto)	[Mondeo, Golf, Fiesta, Punto]	
carStack.pop()	[Mondeo, Golf, Fiesta]	Punto
carStack.push(Civic)	[Mondeo, Golf, Fiesta, Civic]	
carStack.push(Porsche)	[Mondeo, Golf, Fiesta, Civic, Porsche]	
carStack.isFull()		False
carStack.pop()	[Mondeo, Golf, Fiesta,Civic]	Porsche
carStack.pop()	[Mondeo, Golf, Fiesta]	Civic

Worksheet 4 Stacks

Unit 7 Data structures



PG ONLINE



2. Complete the pseudocode below for a program which uses a stack to test an input string to determine whether it is a palindrome (the same backwards and forwards, like “peep”)

Assume that a class **Stack** implements the operations in the table in question 1.

```
myString = input ("Please enter a word or phrase to be tested:  
")  
list1 = list(myString)      //convert myString to a list of  
characters  
numChars = len(list1)  
s = Stack()  
//push each character onto the stack  
for char in list1  
    s.push(char)  
next char  
  
list2 = []  #create an empty list  
#pop each character off the stack into a second list  
for char = 0 to numChars - 1  
    list2.append(s.pop())  
next char  
  
#compare the two lists, one is the reverse of the other  
if list1 == list2 then  
    print("This is a palindrome")  
else  
    print("This is not a palindrome")  
endif
```

Worksheet 4 Stacks

Unit 7 Data structures



(See Python/VB programs palindrome.py in folder program folders)